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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/564,956	12/05/2007	Takashi Namari	053547	5396

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EXAMINER	
HAMAOUI, DAVID E	

ART UNIT	PAPER NUMBER
4159	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/564,956	NAMARI ET AL.	
	Examiner	Art Unit	
	DAVID HAMAOUI	4159	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 December 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 - 11* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *18 January 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☒ Certified copies of the priority documents have been received in Application No. 10/564,956.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *1/18.2006, 5/3/2007, 9/27/2007*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1 – 4, and 6 are rejected under 35 U.S.C. 102(b) as being unpatentable over Ohira (US 2002/0112711 A1).

3. In re claim 1, with reference to figure 1, Ohira ('711) discloses a crank angle detector comprising:

- a rotor (10) rotated in association with a crank shaft [0033] of an internal combustion engine and having a plurality of detection portions (20, 22, 24) to be detected at equivalent angle intervals on the outer circumference;
- a pickup (30) arranged at the vicinity of the outer circumference of said rotor, for generating a pulse signal when said plurality of detection portions each pass therethrough;
- …wherein one detection portion (20) located immediately before a crank angle corresponding to the upper dead point of a piston [0033] of said internal combustion engine, of said plurality of detection portions is set to detect a reference angle of the crank angle.

4. In re claims 2, 3, and 4, Ohira ('711) further discloses (figure 1) wherein said plurality of detection portions are constructed by projections, respectively, and the one detection portion for detecting said reference angle is set to a length different from the lengths of the other detection portions in the outer circumferential direction of said rotor.

5. In re claims 6 and 7, Ohira ('711) discloses ([0033] – [0035] and figure 1) an ignition timing controller comprising:

- Crank angle detecting means (10) rotated in association with a crankshaft of an internal combustion engine, for generating a crank angle pulse signal for each rotation of a predetermined angle, and generating the pulse signal immediately before the crank angle corresponding to the upper dead point of a piston of said internal combustion engine, as a reference pulse signal of an aspect different from that of the other crank angle pulse signal;
- Ignition control means (31) for controlling ignition timing of said internal combustion engine in accordance with said crank angle pulse signal;
- ...wherein said ignition control means instructs spark discharge of an ignition plug of said internal combustion engine for the ignition timing in accordance with said crank angle pulse signal generated immediately after said reference pulse signal in a period until said crank shaft is rotated once after cranking of said internal combustion engine is started [0007].

6. *In re claim 8, see above (In re claims 1 – 4).*

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various

claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 5, 9, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohira (US 2002/0112711 A1).

10. In re claim 5, Ohira ('711) further discloses [0033] wherein when the respective rear end positions of the plurality of detection portions are located at equivalent angle intervals in the rotating direction of said rotor, the rear end of a detection portion passing through the vicinity of said pickup next to the one detection portion for detecting said reference angle at a rotating time of said rotor is located within a range of zero to ten degrees from the crank angle corresponding to said upper dead point,

11. Ohira ('711) lacks wherein the respective rear end positions of the plurality of detection portions are located at equivalent angle intervals **of 15 degrees** in the rotating direction of said rotor.

12. A crank angle sensor that is more "full" of detection portions, lacking only one or two detection portions to provide for a reference area, is well known in the art. It would have been obvious to one having ordinary skill in the art at the time the invention was made to add more detection portions such that their equivalent displacement around the rotor's circumference was 15 degrees in order to provide for a more thorough knowledge of the angular position of the crankshaft, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch,* 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Please note that in the instant application, page 5, line 13, applicant has not disclosed any criticality for the claimed limitations.

13. In re claim 9, Ohira ('711) further discloses [0037] wherein said crank angle pulse signal including said reference pulse signal is constructed by a negative pulse and a positive pulse constituting a pair, but lacks, wherein said negative pulse is generated correspondingly to the front end of each of said detection portions, and said positive pulse is generated correspondingly to the rear end of each of said detection portions.

14. Rather, Ohira ('711) discloses wherein the positive pulse corresponds to the front end of each detection portion and the negative pulse corresponds to the rear end. It would have been obvious to one having ordinary skill in the art to have set the pulses in the claimed manner as examiner takes official notice as to the equivalence of these techniques for their use in the art and the selection of any of these known equivalents would be within the level of ordinary skill in the art.

15. In re claim 10, Ohira ('711) further discloses [0051] wherein said ignition control means discriminates said reference pulse signal in accordance with the magnitude of a ratio of the generating interval of said negative pulse and the generating interval of said positive pulse.

16. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ohira (US 2002/0112711 A1) in view of Namari (US 2002/0026825 A1).

17. In re claim 11, Ohira ('711) has been discussed and further discloses wherein said ignition control means instructs an electric supply to said ignition coil in the period until said crank shaft is rotated once after the cranking of said internal combustion engine is started, and then also instructs the spark discharge of said ignition plug.

18. Ohira ('711) lacks [**the limitations indicated in bold:**] wherein said ignition control means instructs an electric supply to said ignition coil **when a value provided by dividing the**

generating interval of said negative pulse by the generating interval of said positive pulse is sufficiently smaller than one in the period until said crank shaft is rotated once after the cranking of said internal combustion engine is started, and then also instructs the spark discharge of said ignition plug **when the value provided by dividing the generating interval of said negative pulse by the generating interval of said positive pulse is sufficiently greater than one.**

19. Namari ('825) discloses [0050 – 0052; and figure 7] wherein said ignition control means instructs an electric supply to said ignition coil when a value provided by dividing the generating interval of said negative pulse by the generating interval of said positive pulse is sufficiently smaller than one in the period until said crank shaft is rotated once after the cranking of said internal combustion engine is started, and then also instructs the spark discharge of said ignition plug when the value provided by dividing the generating interval of said negative pulse by the generating interval of said positive pulse is sufficiently greater than one.

20. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Ohira ('711) by using the technique [using aforementioned ratio] for locating the reference area as taught by Namari ('825) in order to locate the reference area of Ohira ('711) using simple circuitry and code.

Double Patenting

21. Claims 1 - 11 rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1 - 16 of **U.S. Patent No. 7360407**. Although the conflicting claims are not identical, they are not patentably distinct from each other because both claim a crank angle sensor with associated method for determining spark timing based on ratios

between adjacent detection portions around the circumference of a rotor wherein one detection portion is longer than the others.

Conclusion

22. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Cebis et al (US 6,208,131) discloses a similar spark timing apparatus and method.

23. See PTO-892: Notice of References Cited.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DAVID HAMAOUI whose telephone number is 571-270-5625. The examiner can normally be reached on Monday - Friday, 7:30am - 5:00pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, George Nguyen can be reached on 571-272-4491. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/DAVID HAMAOUI/
Examiner, Art Unit 4159

/Quang T Van/
Primary Examiner, Art Unit 3742